

What is claimed is:

1. An electrostrictive terpolymer comprising:

vinylidene fluoride;

trifluoroethylene; and

at least one monomer, wherein said at least one monomer is an ethylene-based monomer and has at least one halogen atom side group, wherein said at least one monomer favors gauche-type linkage along a backbone of a polymer chain of said terpolymer.

2. The electrostrictive terpolymer according to claim 1 wherein said halogen atom side group is of a size sufficient to move said polymer chain away from an adjacent polymer chain without inhibiting the formation of polymer crystallites.

3. The electrostrictive terpolymer according to claim 2 wherein said halogen atom side group is chlorine.

4. The electrostrictive terpolymer according to claim 1 wherein said at least one monomer is a chlorofluoroethylene selected

from the group consisting of 1-chloro-2-fluoroethylene and 1-chloro-1-fluoroethylene.

5. The electrostrictive terpolymer according to claim 4 wherein said terpolymer comprises from about 65 mole % to about 71 mole % vinylidene fluoride, from about 26 mole % to about 33 mole % trifluoroethylene and from about 1 mole % to about 6 mole % chlorofluoroethylene.

6. The electrostrictive terpolymer according to claim 1 wherein said terpolymer comprises from about 65 mole % to about 71 mole % vinylidene fluoride, from about 26 mole % to about 33 mole % trifluoroethylene and from about 1 mole % to about 6 mole % said at least one monomer.

7. An electrostrictive terpolymer comprising:

from about 65 mole % to about 71 mole % vinylidene fluoride;

from about 26 mole % to about 33 mole % trifluoroethylene; and

from about 1 mole % to about 6 mole % of a chloro-monomer which favors *gauche*-type linkage, wherein said chloro-monomer is selected from the group consisting of 1-chloro-2-fluoroethylene and 1-chloro-1-fluoroethylene.

8. A method of synthesizing an electrostrictive terpolymer film comprising steps of:

combining vinylidene fluoride, trifluoroethylene, and at least one monomer to form a terpolymer, wherein said at least one monomer is an ethylene-based monomer and has at least one halogen atom side group, wherein said at least one monomer favors *gauche*-type linkage along a backbone of a polymer chain of said terpolymer;

forming said terpolymer into a thin film by a process selected from the group consisting of solvent casting and extrusion; and

annealing said terpolymer.

9. The method of synthesizing an electrostrictive terpolymer film according to claim 8 wherein said halogen atom side group is of a size sufficient to move said polymer chain away from an

adjacent polymer chain without inhibiting the formation of polymer crystallites.

10. The method of synthesizing an electrostrictive terpolymer film according to claim 9 wherein said halogen atom side group is chlorine.

11. The method of synthesizing an electrostrictive terpolymer film according to claim 10 wherein said at least one monomer is a chlorofluoroethylene selected from the group consisting of 1-chloro-2-fluoroethylene and 1-chloro-1-fluoroethylene.

12. The method of synthesizing an electrostrictive terpolymer film according to claim 8 wherein said terpolymer comprises from about 65 mole % to about 71 mole % vinylidene fluoride, from about 26 mole % to about 33 mole % trifluoroethylene and from about 1 mole % to about 6 mole % said at least one monomer.

13. A method of synthesizing an electrostrictive terpolymer film comprising steps of:

combining from about 65 mole % to about 71 mole % vinylidene fluoride, from about 26 mole % to about 33 mole % trifluoroethylene and from about 1 mole % to

about 6 mole % chlorofluoroethylene to form a terpolymer;

forming said terpolymer into a thin film by a process selected from the group consisting of solvent casting and extrusion; and

annealing said terpolymer.